



# Oberseminar Mathematische Strömungsmechanik

Institut für Mathematik der Julius-Maximilians-Universität Würzburg

**Hyperbolic equations - structure preserving methods & other topics**

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## Semi-implicit hybrid finite volume-finite element schemes for all Mach number flows

*Abstract:*

In this seminar, we are going to present a new family of semi-implicit hybrid finite-volume finite element methods applied to Euler and Navier-Stokes equations at all Mach numbers. A flux splitting strategy allows for the decomposition of the original system into two sub-systems. The first of them, corresponding with convection and viscous stress tensor terms is solved using an explicit local ADER-FV method. In the second step, the pressure system is solved using an implicit finite element method and the correction of intermediate conservative variables is performed. Let us note that the method is asymptotically consistent with the incompressible limit of the governing equations and can therefore be applied to at all Mach numbers. Moreover, the flux splitting employed yields to a CFL restriction independent from the sound velocity resulting on a method computationally efficient to solve low Mach number flows. The method is validated at the aid of classical benchmarks from the incompressible limit to compressible flows with shock waves.

via Zoom video conference (request the Zoom link from [klingen@mathematik.uni-wuerzburg.de](mailto:klingen@mathematik.uni-wuerzburg.de))

Friday, Mar. 19 at 3 pm CET

Zu diesem Vortrag sind Sie herzlich eingeladen.

*gez. Christian Klingenberg*